

I CLAIM:

1. Apparatus for applying a thin aluminum layer to an iron article, comprising

a container for receiving aluminum and a heater for heating the aluminum to produce liquid aluminum in the container, the container having an outlet nozzle; and

a system including a fluid supply for delivering a fluid under pressure into the container for delivering a high velocity aluminum mist from the nozzle onto the article.

2. The apparatus of claim 1 further comprising a heater for heating the iron article to at least 400°F and not greater than a temperature affecting the temper of the article.

3. The apparatus of claim 2 wherein the aluminum heater generates droplets of liquid aluminum and wherein the fluid delivering system is a gas delivering system for delivering a gas through the container and through the nozzle for disintegrating the aluminum droplets into a fine aluminum mist in the container and delivering the fine aluminum mist out of the container through the nozzle, the fine aluminum mist being invisible to the naked eye in daylight.

4. The apparatus of claim 3 wherein the gas delivering system includes a gas supply at a pressure of at least 25 psig.
5. The apparatus of claim 3 wherein the gas delivering system includes a gas supply at a pressure of at least 100 psig.
6. The apparatus of claim 3 wherein the wherein nozzle provides an outlet opening in the shape of a circle.
7. The apparatus of claim 1 wherein the velocity of the aluminum mist exiting the nozzle is at least 50 feet per second.
8. The apparatus of claim 1 wherein the velocity of the aluminum mist exiting the nozzle is at least 300 feet per second.
9. The apparatus of claim 1 wherein the aluminum heater is capable of heating the aluminum to at least 2000°F to produce a body of liquid aluminum in the container and the fluid supply is capable of pressurizing the container to at least 25 psig.
10. The apparatus of claim 9 wherein the fluid supply is capable of pressuring the container to at least 100 psig.

11. The apparatus of claim 9 wherein nozzle provides an outlet opening in the shape of an elongate slot.

12. A method of applying a thin aluminum layer to an iron article, comprising

producing liquid aluminum in a container;

delivering a fluid into the container and thereby pressurizing the container;

projecting an aluminum mist through an outlet from the container onto an iron article thereby producing a thin aluminum layer on the iron article; and then

allowing the iron article to cool to ambient.

13. The method of claim 12 wherein the iron article is heated to at least 400°F, wherein the aluminum is heated in the container to produce liquid aluminum droplets on a body of solid aluminum and wherein the fluid delivering step comprises delivering a gas into the container thereby dislodging the aluminum droplets from the body of solid aluminum and converting the droplets into a mist.

14. The method of claim 13 wherein the iron article is heated to at least 1100°F.

15. The method of claim 13 wherein the aluminum mist is so fine as to be invisible in daylight.

16. The method of claim 12 wherein the article is cooled to ambient without additional heating.

17. The method of claim 12 wherein the aluminum is heated in the container to at least 2000°F to produce a pool of liquid aluminum and pressure in the container forces liquid aluminum through the outlet.

18. The method of claim 17 wherein the outlet comprises a nozzle having an outlet opening in the shape of an elongate slot.

19. The method of claim 12 further comprising spraying additional liquid aluminum onto the thin aluminum layer.

20. The method of claim 12 wherein the fluid is a gas selected from the group consisting essentially of compressed air and nitrogen.

21. An iron article having a layer of aluminum on an exterior portion thereof, the aluminum layer having the characteristic of remaining intact and free of cracks in a bend where a flat strip of

the iron article is bent  $180^{\circ}$  over a radius less than three fourths of one inch.

22. An iron article having a layer of aluminum on an exterior portion thereof, the aluminum layer having the characteristic of remaining intact when a bead of welding rod is welded by an electric arc to the iron article.